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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LE, DANG D	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,326	LIAO, WEN-SHYONG	
	Examiner	Art Unit	
	Dang D. Le	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-13 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-7* is/are allowed.

6)☒ Claim(s) *8,10-13 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/14/05 have been fully considered but they are not persuasive. The applicant's argument is on the ground that the present application shows the supporting device designed in a contact manner. However, the claims do not clearly recite such function of the bearing. In addition, because of the grooves (21 or 107) formed either on the tube or the shaft in Tanaka et al., the entire surface of the bearing can be said to be non-cylindrical.

As a result, the rejections are still deemed proper and repeated hereinafter.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al. (5,998,898) in view of Kuwayama et al. (5,874,793).

Regarding claim 8, Fukutani et al. shows a supporting device of a rotor applied to at least one of a fan or hard disk machine (hard disk in Fukutani et al.), comprising:

- A ceramic (column 6, lines 53-60) axial tube (Figure 1, 12) which is a hollow tube with one end fixed on a rotor (10) and is formed with at least one concave (column 7, line 1) on the outer surface;

- A ceramic axial support which rotationally supports said axial tube, wherein a storage space for lubricants is defined by an inner surface of said ceramic axial support and said concave on said outer surface of said ceramic axial tube, an entire inner surface of said ceramic axial tube being free of lubricants; and
- A spacing between said outer surface of said ceramic axial tube and said inner surface of said ceramic axial support is within the range of an unknown micro meters for dispersing lubricants therefrom.

Fukutani et al. does not show the storage space between the outer surface of the axial tube and the inner surface of the axial support being within the range of 2-25 micrometers.

Kuwayama et al. shows the axial tube (13) and the axial support (12) being made of ceramic and the gap (22) being within the range of 1-30 micrometers (column 6, lines 19-22) for the purpose of preventing dead lock.

Since Fukutani et al. and Kuwayama et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the axial tube and the axial support of ceramic and the gap within 1-30 micro meters including the range of 2-25 micrometers as taught by Kuwayama et al. for the purpose discussed above.

Regarding claim 11, it is noted that Fukutani et al. and Kuwayama et al. also shows the concave being formed in a middle circular concave part of the axial tube.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al. in view of Kuwayama et al. as applied to claim 8 above, and further in view of Komatsu.

Regarding claim 10, the supporting device of Fukutani et al. modified by Kuwayama et al. includes all of the limitations of the claimed invention except for ceramic powders of a metal oxide selected from the group consisting of aluminum oxide, zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent, an assisting agent and a dispersing agent at a predetermined ratio.

Komatsu shows ceramic powders (Abstract and column 1, lines 15-30) of a metal oxide selected from the group consisting of aluminum oxide (column 6, line 50), zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent (column 3, lines 60-67), an assisting agent and a dispersing agent at a predetermined ratio (column 1, lines 35-50) for the purpose of making bearing components.

Since Fukutani et al., Kuwayama et al. and Komatsu are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make a bearing with ceramic powders of a metal oxide

selected from the group consisting of aluminum oxide, zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent, an assisting agent and a dispersing agent at a predetermined ratio as taught by Komatsu for the purpose discussed above.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al. in view of Kuwayama et al. as applied to claim 8 above, and further in view of Davies.

Regarding claim 12, the supporting device of Fukutani et al. modified by Kuwayama et al. includes all of the limitations of the claimed invention except for the lubricant being a fluoride containing lubricant with a particle diameter smaller than 1 micron.

Davies shows the lubricant being a fluoride containing lubricant with a particle diameter smaller than 1 micron (column 2, lines 1-15) for the purpose of reducing friction.

Since Fukutani et al., Kuwayama et al. and Davies are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the lubricant a fluoride containing lubricant with a particle diameter smaller than 1 micron as taught by Davies for the purpose discussed above.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (6,712,513) in view of Kuwayama et al. (5,874,793).

Regarding claim 13, Tanaka et al. shows a supporting device of a rotor applied to at least one of a fan or hard disk machine (hard disk in Tanaka et al.), comprising:

- An axial tube (13) which is a hollow tube having one end fixed on the rotor (14) and the other end opening closed by a lid (20);
- At least one axial support (12) which rotationally supports said axial tube by a rotational corresponding spacing within the range of unknown micrometer which defines a lubricating chamber for receiving lubricant; and
- Means (grooves 13r) for allowing the lubricant to leak onto the outer surface of the axial tube (not to be from the inside of the hollow tube).
- Wherein at least one of the axial tube and the axial support is formed as a non-cylindrical surface (because of grooves 21 and 107).

Tanaka et al. does not clearly show the tube and the support being made of ceramic or the range of 2 – 25 micrometers.

Kuwayama et al. shows the axial tube (13) and the axial support (12) being made of ceramic and the gap (22) being within the range of 1-30 micrometers (column 6, lines 19-22) for the purpose of preventing dead lock.

Since Tanaka et al. and Kuwayama et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the axial tube and the axial support of ceramic and the gap within 1-30 micro meters including the range of 2-25 micrometers as taught by Kuwayama et al. for the purpose discussed above.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. in view of Kuwayama et al. as applied to claim 13 above, and further in view of Komatsu.

Regarding claim 16, the device of Tanaka et al. modified by Kuwayama et al. includes all of the limitations of the claimed invention except for ceramic powders of a metal oxide selected from the group consisting of aluminum oxide, zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent, an assisting agent and a dispersing agent at a predetermined ratio.

Komatsu shows ceramic powders (Abstract and column 1, lines 15-30) of a metal oxide selected from the group consisting of aluminum oxide (column 6, line 50), zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent (column 3, lines 60-67), an assisting agent and a dispersing agent at a predetermined ratio (column 1, lines 35-50) for the purpose of making bearing components.

Since Tanaka et al., Kuwayama et al. and Komatsu are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make a bearing with ceramic powders of a metal oxide selected from the group consisting of aluminum oxide, zirconium oxide, silicon oxide and a mixture thereof being used and uniformly formulated with a plastic agent, an assisting agent and a dispersing agent at a predetermined ratio as taught by Komatsu for the purpose discussed above.

Allowable Subject Matter

8. Claims 1-7 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter: the record of prior art does not show a supporting device of a rotor, which comprises a ceramic axial tube which is a hollow tube with one end opening fixed on and closed by the rotor, and the other end opening closed by a lid, to allow a space formed within the ceramic axial tube to store lubricants as shown in claim 1.

The most relevant references are U.S. Patent Nos. 5,791,784 and 5,938,343 issued to Ichiyama and Grantz et al., respectively. However, the axial tubes of Ichiyama and Grant et al. are neither fixed on and closed by the rotor at one opening and closed by a lid at the other opening nor made of ceramic.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information on How to Contact USPTO

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D. Le whose telephone number is (571) 272-2027. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/21/05

DANG LE
PRIMARY EXAMINER